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PD IEC/TS 62686-1:2015



BSI Standards Publication

Process management for avionics — Electronic components for aerospace, defence and high performance (ADHP) applications

Part 1: General requirements for high
reliability integrated circuits and discrete
semiconductors

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This Published Document is the UK implementation of IEC/TS 62686-1:2015. It supersedes PD IEC/TS 62686-1:2012 which is now withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/107, Process management for avionics.

A list of organizations represented on this committee can be obtained on request to its secretary.

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TECHNICAL SPECIFICATION

**Process management for avionics – Electronic components for aerospace,
defence and high performance (ADHP) applications –
Part 1: General requirements for high reliability integrated circuits and discrete
semiconductors**

INTERNATIONAL
ELECTROTECHNICAL
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CONTENTS

FOREWORD	6
INTRODUCTION	8
1 Scope	9
2 Normative references	9
3 Terms, definitions and abbreviations	10
3.1 Terms and definitions	10
3.2 Abbreviations	12
4 Technical requirements	14
4.1 General	14
4.2 Procedures	14
4.2.1 General	14
4.2.2 Product discontinuance	14
4.2.3 ESD protection during manufacture	14
4.2.4 Specification control	15
4.2.5 Traceability including anti-counterfeit measures	15
4.3 Product or process change notification (PCN)	15
4.3.1 General	15
4.3.2 Notification	15
4.3.3 Notification details	15
4.3.4 Notifiable changes	16
4.4 Shipment controls	16
4.4.1 General	16
4.4.2 Shipping container and date code marking	16
4.4.3 Date code remarking	16
4.4.4 Inner container formation	16
4.4.5 Date code age on delivery	17
4.4.6 ESD marking	17
4.4.7 MSL	17
4.4.8 Lead-free marking	17
4.4.9 Labels	17
4.5 Electrical	18
4.5.1 General	18
4.5.2 Electrical test	18
4.5.3 Electrical parameter assessment	18
4.5.4 SDRAM memories	18
4.5.5 Logic families	19
4.5.6 Power MOSFETs	19
4.5.7 Silicon rectifier diodes	19
4.6 Mechanical	19
4.6.1 General	19
4.6.2 Device marking	19
4.6.3 Small packages	19
4.6.4 Moisture sensitivity	19
4.6.5 Robustness of hermetic seals	19
4.6.6 Termination finishes	20
4.7 Audit capability	20

This is a preview of "PD IEC/TS 62686-1:20...". [Click here to purchase the full version from the ANSI store.](#)

4.7.1	General	20
4.7.2	Internal quality audits	20
4.7.3	Subcontract manufacturing	20
4.8	Quality assurance	21
4.8.1	General	21
4.8.2	Quality system	21
4.8.3	Sampling plans	21
4.8.4	Failure analysis support	21
4.8.5	Outgoing quality	21
4.9	Supplier performance monitoring by the user	22
4.9.1	General	22
4.9.2	Lot acceptance	22
4.9.3	Suspension of deliveries	23
4.9.4	Loss of approval	23
4.9.5	AQL figures	23
4.9.6	100 % screening	23
4.9.7	Termination determination	23
4.10	Qualification	23
4.10.1	General	23
4.10.2	Methodology	24
4.10.3	Test samples	25
4.10.4	Qualification categories	26
4.10.5	Maintenance of qualification standard	26
4.10.6	In-process test results	26
4.10.7	Product monitor results	30
4.10.8	References	30
4.10.9	Qualification report	30
4.10.10	Archiving	30
4.10.11	Qualification by similarity	30
4.10.12	Similarity assessment	30
4.11	Reliability	31
4.11.1	General	31
4.11.2	Operating reliability	31
4.11.3	Failure criteria	31
4.11.4	Corrective action	32
4.11.5	Warranty	32
4.11.6	Suspension of certification	32
4.11.7	Single event effects (SEE)	32
4.12	Product monitor	32
4.12.1	General	32
4.12.2	Monitor programme	32
4.12.3	Problem notification	33
4.12.4	Data reporting	33
4.12.5	Samples	33
4.12.6	Corrective action	33
4.12.7	Product monitor results	33
4.12.8	Accumulated test data	33
4.13	Environmental, health and safety (EHS)	34
4.13.1	General	34

This is a preview of "PD IEC/TS 62686-1:20...". [Click here to purchase the full version from the ANSI store.](#)

4.13.2	EHS compliance	34
4.13.3	Device handling	34
4.13.4	Device materials	34
4.14	Shipping containers	34
4.14.1	General	34
4.14.2	ESD requirements	34
4.14.3	Magazine reuse	36
4.14.4	Tubes	36
4.14.5	Trays	36
4.14.6	Tape and reel	37
4.15	Compliance with internal standards	37
Annex A	(informative) Test code (TC) information	38
A.1	General	38
A.2	TC1 – Autoclave (AC)	38
A.3	TC2 – Bond strength, internal (BS)	38
A.4	TC3 – Die shear strength (DS)	38
A.5	TC4 – Electromigration (EM)	38
A.6	TC5 – Electrostatic discharge (ESD)	39
A.7	TC6 – Electrical test (ET)	39
A.8	TC7 – Electrical distributions (ED)	39
A.9	TC8 – Flammability (FL)	40
A.10	TC9 – Hot carrier injection (HCI)	40
A.11	TC10 – Hermeticity (HE)	40
A.12	TC11 – High temperature bake (HTB)	40
A.13	TC12 – High temperature blocking bias (HTBB)	41
A.14	TC13 – High temperature gate bias (HTGB)	41
A.15	TC14 – High temperature reverse bias (HTRB)	41
A.16	TC15 – High temperature operating life (HTOL)	41
A.16.1	General	41
A.16.2	Qualification conditions	41
A.16.3	Test results assessment	41
A.16.4	Temperature acceleration factor	42
A.16.5	Supply voltage acceleration factor	42
A.17	TC16 – Latch-up (LU)	43
A.18	TC17 – Lead integrity (LI)	43
A.19	TC18 – Lid torque (LT)	43
A.20	TC19 – Mechanical sequence (MS)	43
A.20.1	General	43
A.20.2	Constant acceleration	44
A.20.3	Vibration (variable frequency)	44
A.20.4	Mechanical shock	44
A.21	TC20 – Marking permanency (MP)	44
A.22	TC21 – Non-volatile memory operating life (NVL)	44
A.23	TC22 – Time dependent dielectric breakdown (oxide integrity) (OI)	45
A.24	TC23 – Package dimensions (PD)	45
A.25	TC24 – Power cycling (PTC)	45
A.26	TC25 – Resistance to solder heat (RSH)	45
A.27	TC26 – Solder preconditioning (PC)	45
A.28	TC27 – Solderability (SD)	46

This is a preview of "PD IEC/TS 62686-1:20...". [Click here to purchase the full version from the ANSI store.](#)

A.29	TC28 – Soft error rate (SER).....	46
A.30	TC29 – Steady state operating life (SSOL).....	47
A.31	TC30 – Temperature cycling (TC)	47
A.32	TC31 – Temperature humidity reverse bias (THRB)	47
A.33	TC32 – Temperature humidity bias (THB or HAST)	48
A.34	TC33 – Terminal strength (TS).....	48
A.35	TC34 – Thermal resistance (thermal impedance) (TR)	48
A.36	TC35 – visual inspection (VI)	48
A.36.1	TC35a – External visual inspection	48
A.36.2	TC35b – Internal visual inspection	49
A.37	TC36 – Water vapour content, internal (WV)	49
A.38	TC37 – X-ray inspection (XR)	50
A.39	TC38 – Moisture sensitivity level (MSL)	50
A.40	TC39 – Ball shear test (BST)	50
A.41	TC40 – Negative bias temperature instability (NBTI)	50
A.42	TC41 – Accelerated tin whisker test	50
Annex B (informative) Cross-reference to STACK Specification S/0001 revision 14		51
Bibliography.....		58
Table 1 – Label requirements.....		18
Table 2 – Internal quality audit requirements.....		20
Table 3 – Outgoing quality		22
Table 4 – Incoming test.....		23
Table 5 – Technology/family qualification and device qualification		27
Table 6 – Product monitor tests		34
Table A.1 – Conditions of the DC over voltage stress method of JP001.01 or IEC 62416 test.....		40
Table A.2 – Examples of temperature acceleration factors		42
Table A.3 – Dip and look test references.....		46
Table A.4 – Parameter values for consideration		46
Table A.5 – Test conditions.....		47
Table A.6 – Test methods		48

This is a preview of "PD IEC/TS 62686-1:20...". [Click here to purchase the full version from the ANSI store.](#)

INTERNATIONAL ELECTROTECHNICAL COMMISSION

PROCESS MANAGEMENT FOR AVIONICS – ELECTRONIC COMPONENTS FOR AEROSPACE, DEFENCE AND HIGH PERFORMANCE (ADHP) APPLICATIONS –

Part 1: General requirements for high reliability integrated circuits and discrete semiconductors

FOREWORD

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- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

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IEC TS 62686-1, which is a Technical Specification, has been prepared by IEC technical committee 107: Process management for avionics.

This second edition cancels and replaces the first edition, published in 2012. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) adoption and modification of STACK Specification S/0001 revision 14 notice 3, *General requirements for integrated circuits and discrete semiconductors*;
- b) update of IEC semiconductor test methods;
- c) update of JEDEC semiconductor test methods; including addition of JEP148A, based on the Physics of Failure Risk and Opportunity assessment;
- d) update of Annex A with additional JEDEC and IEC test information;
- e) revision of lead-free termination finish requirements.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
107/248/DTS	107/259/RVC

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 62686 series, published under the general title *Process management for avionics – Electronic components for aerospace, defence and high performance (ADHP) applications*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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INTRODUCTION

This part of IEC 62686 includes all the requirements of STACK Specification S/0001 revision 14 notice 3 and contains revisions for alternative IEC qualification test methods and additional test information.

This Technical Specification complements IEC TS 62564-1 which is used for ADHP applications when additional manufacturer's data is required beyond the publicly available manufacturer published data sheets (e.g. when additional thermal performance data is required for thermally challenging applications or when additional verification data are needed, for example to comply with the requirements of RTCA DO-254/EUROCAE ED-80 for complex components for flight critical applications, etc.).

This Technical Specification can also be used to comply with the typical qualification requirements of IEC TS 62564-1. Further guidance is given in IEC TS 62239-1.

NOTE With the adoption of the STACK Specification S/0001 revision 14 notice 3 it will be possible for all existing STACK certified manufacturers to be audited by IECQ under the new STACK-IECQ joint venture.

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PROCESS MANAGEMENT FOR AVIONICS – ELECTRONIC COMPONENTS FOR AEROSPACE, DEFENCE AND HIGH PERFORMANCE (ADHP) APPLICATIONS –

Part 1: General requirements for high reliability integrated circuits and discrete semiconductors

1 Scope

This part of IEC 62686, which is a Technical Specification, defines the minimum requirements for general purpose "off the shelf" COTS (commercial off-the-shelf) integrated circuits and discrete semiconductors for ADHP (aerospace, defence and high performance) applications.

This Technical Specification applies to all components that can be operated in ADHP applications within the manufacturers' publicly available data sheet limits in conjunction with IEC TS 62239-1. It may be used by other high performance and high reliability industries, at their discretion.

ADHP application requirements may not necessarily be fulfilled by this specification alone. ADHP OEMs (original equipment manufacturers) may need to consider redesigning their products or conducting further testing to verify suitability in ADHP applications using their IEC TS 62239-1 ECMP procedures. Alternatively a component in accordance with IEC TS 62564-1 may be more suitable.

2 Normative references

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

ISO 9001, *Quality management systems – Requirements*

ISO TS 16949, *Quality management systems – Particular requirements for the application of ISO 9001:2008 for automotive production and relevant service part organizations*

ANSI/EIA-556, *Outer Shipping Container Bar Code Label Standard*

ANSI/ESD S541, *Packaging Materials Standards for ESD Sensitive Items*

AS/EN/JISQ 9100, *Aerospace series – Quality management systems – Requirements for aviation, space and defense organisations*

IPC/JEDEC J-STD-020, *Moisture/Reflow Sensitivity Classification for Nonhermetic Solid State Surface Mount Devices*

IPC/JEDEC J-STD-033, *Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices*

IPC/JEDEC J-STD-609, *Marking and Labeling of Components, PCBs and PCBAs to Identify Lead (Pb), Lead-Free (Pb-Free) and Other Attributes*