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NORME INTERNATIONALE

Electronics assembly technology – Electronic modules

Techniques d'assemblage des composants électroniques – Modules électroniques

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ELECTRONICS ASSEMBLY TECHNOLOGY – ELECTRONIC MODULES

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

FDIS	Report on voting
91/689/FDIS	91/722/RVD

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

The French version of this standard has not been voted upon.

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ELECTRONICS ASSEMBLY TECHNOLOGY – ELECTRONIC MODULES

1 Scope and object

This International Standard provides a generic standard of electronic modules on which their sectional standards are based.

This standard provides a definition, business model, interface between the trading partners, and related areas of standardization of electronic modules. In addition a generic set of test method is provided.

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 60068 (all parts), *Environmental testing*

IEC 60068-1:1988, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-1: *Environmental Testing – Part 2-1: Tests – Test A: Cold*

IEC 60068-2-2: *Environmental testing – Part 2-2: Tests – Tests B: Dry heat*

IEC 60068-2-6: *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-14: *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-20: *Environmental testing – Part 2-20: Tests – Test T: Soldering*

IEC 60068-2-21: *Environmental testing – Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices*

IEC 60068-2-27: *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-45: *Environmental testing – Part 2-45: Tests – Test XA and guidance: Immersion in cleaning solvents*

IEC 60068-2-58: *Environmental testing – Part 2-58: Tests – Test Td: Test methods for solderability, resistance to dissolution of metallization and to soldering heat of surface mounting devices (SMD)*

IEC 60068-2-78: *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

ISO 3: *Preferred numbers – Series of preferred numbers*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in the IEC 60068 series, as well as the following, apply.

3.1
electronic module
functional block which contains individual electronic elements and /or electronic packages, to be used in a next level assembly

NOTE An individual module having an application-specific function, including electronic, optoelectronic, mechanical or other elements. The module typically provides protection of its elements and packages to assure the required level of reliability.

Electronic modules may be categorized by signal interface, for example:

– wired module: a module which has only electrical interfaces (majority of present day modules)

– wireless module: a module which has a wireless interface

– opto-electronic module: a module which has an optoelectronic interface

– sensor module: a module which can input physical information

– actuator module: a module which could output physical information

3.2
coplanarity
distance in height between the lowest and highest leads or terminals when the module is in its seating plane

3.3
operating temperature range
range of the ambient temperature at which an electronic module may be used continuously

3.4
storage temperature range
range of the ambient temperature at which an electronic module may be stored continuously

3.5
rated voltage
maximum d.c. voltage or the root-mean square value of an a.c. voltage which may be applied continuously to an electronic module at any temperature within the operating temperature range

4 Business model and interface between supplier and user

4.1 Business model (see Figure 1 and Figure 2)

4.1.1 General

Business models for electronic module manufacturing are classified into three types (See Figure 1):

– E-type;

– M-type;

– F-type business models.

A supplier of material/parts is at one end of a business chain, from the viewpoint of an electronic module supplier. A user of electronic modules is at the other end of the chain.

Items to be specified in standards of electronic modules depend on the business model to which the relevant module is classified.

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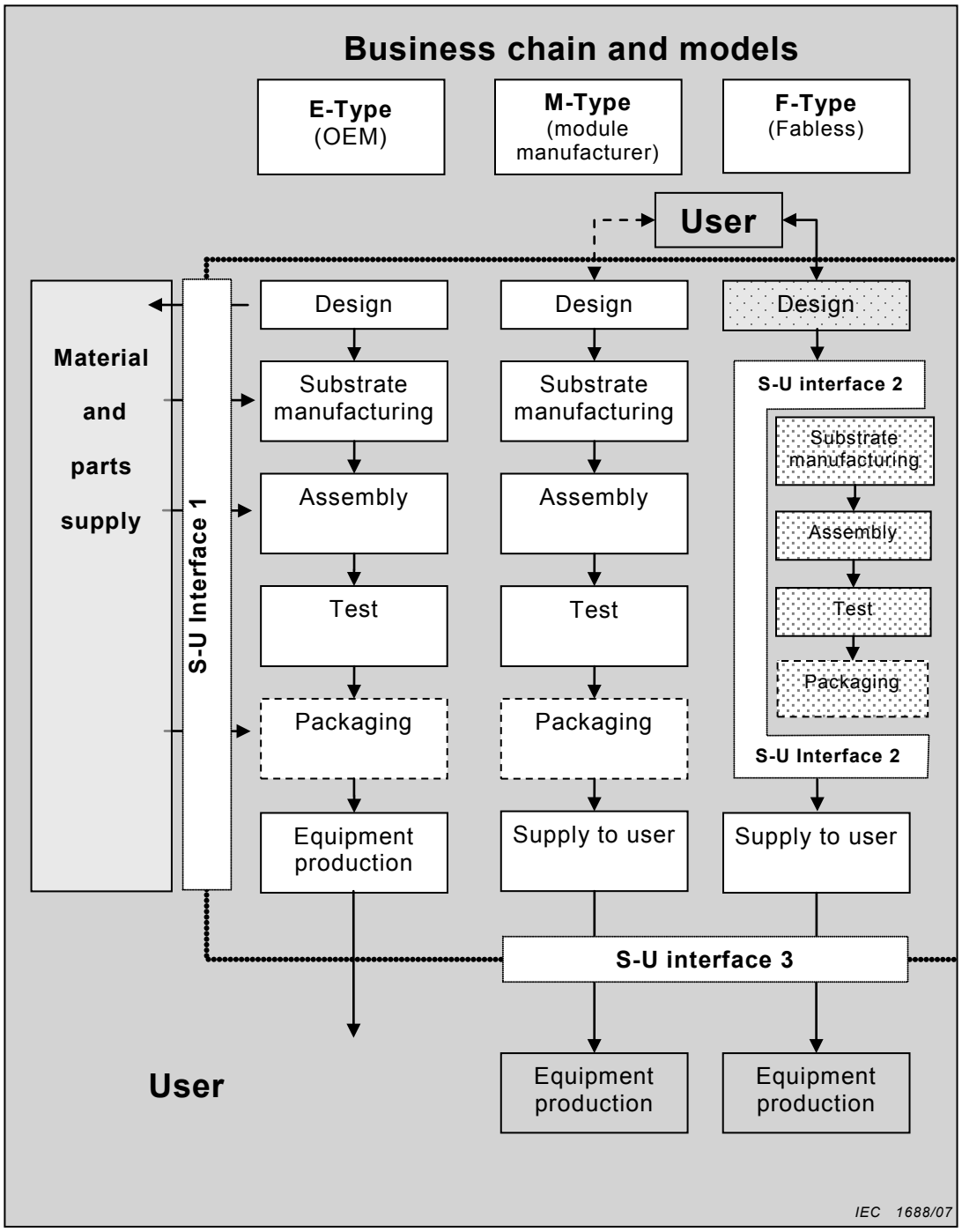
Items to be standardized basically depend on the relationship between suppliers and users (S-U Interface). Moreover, the S-U Interface depends on the business model.

The S-U interface showing the relationship between suppliers and users shall be clarified in the scope of a standard for an electronic module.



NOTE S-U interface: Supplier and user interface.

Figure 1 – S-U interfaces in each business model

4.1.2 E-type business model

The user of the electronic modules is also the supplier of the electronic modules. (The modules are designed, manufactured and used within the same company.)

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An S-U interface exists only between the supplier of materials/parts and the supplier of the electronic modules.

NOTE Certain design or manufacturing processes may be subcontracted under the responsibility of the manufacturer.

4.1.3 M-type business model

The supplier of the electronic modules designs, manufactures and supplies the electronic modules to the user.

An S-U interface exists between the supplier and the user of the electronic modules. An additional S-U interface may also exist between suppliers of materials/parts and the supplier of the electronic modules.

NOTE Certain designs or manufacturing processes may be subcontracted under the responsibility of the module manufacturer.

4.1.4 F-type business model

The (fabless) supplier of the electronic modules designs and supplies the electronic modules to the user. Final design and manufacturing takes place at one or more specialized subcontractors (original design manufacturer (ODM) - foundries).

In this case, S-U interfaces are found between the designer (fabless) and the manufacturers (ODM - foundries) of electronic modules, between the supplier and the user of electronic modules, and also between the suppliers of materials/parts and the supplier of electronic modules.

NOTE More complex allotment of business may exist in the F-type business model. When sectional standards for F-type business model are developed, details of the interface should be defined in them.

4.2 S-U interface (see Figure 1)

4.2.1 S-U interface –1

The S-U interface–1 is defined as the interface between the supplier of electronic modules and supplier of material/parts.

This interface exists on all the E-type, M-type and F-type business models.

4.2.2 S-U interface–2

The S-U interface–2 is defined as the interface between designer (fabless) and the manufacturers (ODM - foundries) of electronic modules.

This interface is found only in the F-type business model.

4.2.3 S-U interface–3

The S-U interface–3 is defined as the interface between supplier and user of electronic modules.

This interface exists in both of the M-type and F-type business models.

4.3 Standardization areas

Figure 2 shows typical standardization areas in M-type and F-type business models. The standardization area of S-U interface–3 is described in Clause 5 and Clause 6 of this standard.

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