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2022 - July

General Electronic Components Model Based Definition (MBD) Standard

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General Electronic Components Model Based Definition (MBD) Standard

Developed by the Model Based Definition (MBD) for Digital Twins Task Group (2-12b) of the Electronic Product Data Description Committee (2-10) of IPC and the Digital Association of China (DAC)

Users of this publication are encouraged to participate in the development of future revisions.

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Acknowledgment

Any document involving a complex technology draws material from a vast number of sources across many continents. While the principal members of the Model Based Definition (MBD) for Digital Twins Task Group (2-12b) of the Electronic Product Data Description Committee (2-10) are shown below, it is not possible to include all of those who assisted in the evolution of this standard. To each of them, the members of IPC extend their gratitude.

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Table of Contents

1	SCOPE	1	6.4.5	Component Mounting Positioning Label	13
1.1	Purpose	1	6.4.6	Part and Module Label	13
1.1.1	Application of This Standard	1	6.4.7	Design Constraint Geometry Label	13
1.2	Classification	1	6.4.8	Body Conductive Area Label	15
1.3	Definition of Requirements	1	6.4.9	Other Geometry Label	15
1.4	Order of Precedence	1	6.5	Weight Information	15
1.4.1	Conflict	2	6.6	Packaging Information	15
1.4.2	Clause References	2	6.7	Process Requirement Information	15
1.5	Abbreviations and Acronyms	2	6.7.1	Assembly Mode	15
1.6	Terms and Definitions	2	6.7.2	SMT Process Requirements	15
1.7	Use of “Lead”	2	6.7.3	THT Process Requirements	16
2	APPLICATION DOCUMENTS	2	6.7.4	Hotbar Process Requirements	17
2.1	IPC	2	6.7.5	Press-Fit Process Requirements	17
2.2	Joint Standards	2	6.7.6	Screw Installation Process Requirements	18
2.3	ASTM International	2	6.8	Risk Sensitivity Information	18
2.4	EIA	2	6.9	Packing Information	19
2.5	ISO	2	6.10	Environmental Information	23
2.6	JEDEC	3	6.11	Storage Information	23
2.7	The World Wide Web Consortium (W3C)	3	6.12	Vendor Information	23
3	PRINCIPLES FOR BUILDING COMPONENT MBD MODEL	3	6.13	Naming Convention for MBD Files	23
4	CLASSIFICATION OF GENERAL ELECTRONIC COMPONENTS	3	6.14	Example	23
4.1	Classification by Function	3	6.14.1	Example 1: Chip Component	23
4.2	Classification by Assembly Mode	4	6.14.2	Example 2: BGA chip	28
4.3	Classification by Lead Type	4	6.14.3	Example 3: Connector	33
5	MODEL COMPOSITION INFORMATION	9	7	DATA FORMAT – XML SCHEMA	36
5.1	Component Physical Geometry	9	7.1	General Data Type	36
5.1.1	Component Lead Geometry	9	7.1.1	Cartesian_point Type	36
5.1.2	Component Body Geometry	10	7.1.2	Direction Type	36
5.1.3	Coloring for Body Geometry	12	7.1.3	Axis2_placement_3d Type	37
5.2	Design Constraint Geometry	12	7.1.4	Toleranced_value Type	37
6	MODEL SEMANTIC INFORMATION	12	7.1.5	Geometry_pointer Type	39
6.1	Unit System Information	12	7.1.6	Unit_enum Type	39
6.2	Dimension and Tolerance Information	12	7.1.7	SI_prefix_enum Type	40
6.3	Material Information	13	7.1.8	Float_with_unit Type	41
6.4	Geometric Label Information	13	7.1.9	Toleranced_value_with_unit Type	41
6.4.1	PIN Number Label	13	7.2	IPC-2552 Element	42
6.4.2	Deformable Part Label	13	7.2.1	Physical_composition_type Type	43
6.4.3	Component Polarity Identification	13	7.2.2	Design_constraint_geometry_type Type	54
6.4.4	Component Orientation Identifier	13	7.2.3	Size_and_tolerance Type	56
			7.2.4	Geometry_and_material Type	57
			7.2.5	Geometry_labels_type Type	59

7.2.6	Weight_type Type	60	Figure 6-7	Schematic Diagram of Design Constraint Geometry Label	14	
7.2.7	Packaging_enum Type	60	Figure 6-8	Schematic Diagram of Body Shape Conductive Area Label	14	
7.2.8	Technology_requirement_by_mounting Type	60	Figure 6-9	Tray Length	19	
7.2.9	Risk_sensitive_info_type Type	65	Figure 6-10	Component Pin 1	20	
7.2.10	Packing_type Type	69	Figure 6-11	Tape Hole Pitch	20	
7.2.11	Environment_info_type Type	74	Figure 6-12	Tape Cavity Pitch	20	
7.2.12	Storage_info_type Type	74	Figure 6-13	Tape Width	20	
7.2.13	Supplier_info_type Type	75	Figure 6-14	Silver Package Marking	21	
7.3	Storage Format of the MBD File	75	Figure 6-15	Tin Package Marking	21	
7.3.1	File Header	76	Figure 6-16	Moisture Grade Package Marking	21	
7.3.2	Data Composition Files	76	Figure 6-17	Humidity Indicator Card	22	
7.3.3	Data Checksum	76	Figure 6-18	Model Geometry Schematic Diagram for Chip Components	24	
APPENDIX A – Abbreviations and Acronyms			77	Figure 6-19	Model Geometry Schematic Diagram for BGAs	28
Figures				Figure 6-20	Model Geometry Schematic Diagram for Connectors	33
Figure 4-1	Chip Components	4	Figure 7-1	Cartesian_point Type	36	
Figure 4-2	BGAs	4	Figure 7-2	Direction Type	37	
Figure 4-3	Gull Wing Leads	5	Figure 7-3	Angle_placement_3d Type	37	
Figure 4-4	J-Type Lead	5	Figure 7-4	Value_with_deviation Type	38	
Figure 4-5	Inverted J-Type Lead	5	Figure 7-5	Value_with_limit Type	38	
Figure 4-6	I-Type Lead	6	Figure 7-6	Value_with_percentage Type	38	
Figure 4-7	L-Type Lead (Outward)	6	Figure 7-7	Geometry_pointer Type	39	
Figure 4-8	L-Type Lead (Inward)	7	Figure 7-8	Float_with_unit Type	41	
Figure 4-9	Flat Lug Leads	7	Figure 7-9	Toleranced_value_with_unit Type	41	
Figure 4-10	Through-Hole Lead	7	Figure 7-10	IPC-2552 Element	42	
Figure 4-11	Press-Fit Lead	7	Figure 7-11	Physical_composition_type Type	43	
Figure 4-12	Leadless Type	8	Figure 7-12	Leads_composition_type Type	43	
Figure 4-13	Screw Type	8	Figure 7-13	Lead_index_mapping_standard Type	43	
Figure 4-14	Hybrid Lead 1	8	Figure 7-14	Lead_mapping_table Group and Lead_mapping_item Element	44	
Figure 4-15	Hybrid Lead 2	9	Figure 7-15	Lead_group_list Group and Lead_group Element	44	
Figure 4-16	Hybrid Lead 3	9	Figure 7-16	Single_lead_type Type	45	
Figure 5-1	Model Composition	9	Figure 7-17	Pattern Type	45	
Figure 5-2	Geometric Profile of BGA Components	10	Figure 7-18	Rectangular_pattern Type	45	
Figure 6-1	Schematic Diagram of Pin Number Label	13	Figure 7-19	Definition of the Parameters of Rectangular Pattern	46	
Figure 6-2	Schematic Diagram of Deformable Part Label	13	Figure 7-20	Circular_pattern Type	47	
Figure 6-3	Schematic Diagram of Component Polarity Identification	14	Figure 7-21	Definition of the Parameters of Circular Pattern	47	
Figure 6-4	Schematic Diagram of Component Orientation Identifier	14	Figure 7-22	General_pattern Type	48	
Figure 6-5	Schematic Diagram of Component Mounting Positioning Label	14				
Figure 6-6	Schematic Diagram of Part and Module Label	14				

Figure 7-23	Body_composition_type Type	48
Figure 7-24	Body_components_type Type	48
Figure 7-25	BGA_composition Type	49
Figure 7-26	Leadframe_composition Type	50
Figure 7-27	Other_substrate_composition Type	51
Figure 7-28	Connector_composition Type	52
Figure 7-29	Optical_device_composition Type	53
Figure 7-30	Design_constraint_geometry_type Type	54
Figure 7-31	Package_keepout_area_and_height Type	55
Figure 7-32	Package_keepout_space_3D Type	55
Figure 7-33	Hole_keepout_area_list Group and Hole_keepout_area Element	56
Figure 7-34	Design_constraint_geometry_list Group and Design_constraint_geometry Element	56
Figure 7-35	Size_and_tolerance Type	57
Figure 7-36	Geometry_and_material Type	57
Figure 7-37	Material_type Type	58
Figure 7-38	Stress_strain_property Type	58
Figure 7-39	Interpolation_table_list group and Interpolation_table Element	59
Figure 7-40	Point_list Group and Point Element	59
Figure 7-41	Geometry_labels_type Type	59
Figure 7-42	Label_item Type	60
Figure 7-43	Weight_type Type	60
Figure 7-44	SMT_technology Type	61
Figure 7-46	Hotbar_technology Type	63
Figure 7-47	Press-Fit_technology Type	64
Figure 7-48	Screw_assembly_technology Type	65
Figure 7-49	Risk_sensitive_info_type Type	65
Figure 7-50	Stress_sensitivity_type Type	67
Figure 7-51	Stress_type Type	67
Figure 7-52	Chemical_compatibility_type Type	67
Figure 7-53	Process_conditions_type Type	68
Figure 7-54	ESE_requirement_type Type	68
Figure 7-55	ESD_classification_type Type	68
Figure 7-56	Packing_type Type	70
Figure 7-57	Packing_requirement_on_ESD Type	73
Figure 7-58	ESD_requirement_for_intermediate_packing Type	73
Figure 7-59	ESD_requirement_for_direct_packing_material Type	74
Figure 7-60	Environment_info_type Type	74
Figure 7-61	Storage_info_type Type	74
Figure 7-62	Supplier_info_type Type	75

Tables

Table 4-1	Classification By Function	3
Table 4-2	Classification by Assembly Mode	4
Table 4-3	Classification by Lead Type	4
Table 5-1	Geometric Hierarchy of Component Leads	10
Table 5-2	Geometric Hierarchy of Component Body	10
Table 5-3	Body Geometry of BGA Type Components	11
Table 5-4	Body Geometry of Lead-Frame Type Components	11
Table 5-5	Body Geometry of Other Substrate-Based Components	11
Table 5-6	Body Geometry of Connectors	11
Table 5-7	Body Geometry of Optical	12
Table 5-8	Geometric Hierarchy of Design Constraints	12
Table 6-1	Dimension and Tolerance Information	13
Table 6-2	Material Information	13
Table 6-3	Packaging Type	15
Table 6-4	SMT Process Requirements	16
Table 6-5	THT Process Requirements	16
Table 6-6	Hotbar Process Requirements	17
Table 6-7	Press-Fit Process Requirements	17
Table 6-8	Screw Installation Process Requirements	18
Table 6-9	Risk Sensitivity Information	18
Table 6-10	Packing Information	19
Table 6-11	Environmental Information	23
Table 6-12	Storage Information	23
Table 6-13	Naming Convention	23
Table 6-14	Model Geometry Hierarchy for Chip Components	24
Table 6-15	Model Semantic Information for Chip Components	24
Table 6-16	Model Geometry Hierarchy for BGAs	29
Table 6-17	Model Semantic Information for BGAs	29
Table 6-18	Model Geometry Hierarchy for Connectors	33
Table 6-19	Model Semantic Information for Connectors	33
Table 7-1	Cartesian_point Type	36
Table 7-2	Direction Type	37
Table 7-3	Axis2_placement_3d Type	37
Table 7-4	Parameter of Toleranced_value Type	37
Table 7-5	Value_with_deviation Type	38
Table 7-6	Value_with_limit Type	38
Table 7-7	Value_with_percentage Type	38

Table 7-8	Geometry_pointer Type	39	Table 7-46	Packaging_enum Type Enumerations	60
Table 7-9	Unit_enum Type Enumerations	39	Table 7-47	SMT_technology Type	61
Table 7-10	SI_prefix_enum Type Enumerations	40	Table 7-48	THT_technology Type	62
Table 7-11	Float_with_unit Type	41	Table 7-49	Hotbar_technology Type	63
Table 7-12	Toleranced_value_with_unit Type	41	Table 7-50	Press-Fit_technology Type	64
Table 7-13	IPC-2552 Element	42	Table 7-51	Screw_assembly_technology Type	65
Table 7-14	Physical_composition_type Type	43	Table 7-52	Risk_sensitive_info_type Type	65
Table 7-15	Leads_composition_type Type	43	Table 7-53	Temperature_sensitivity_enum Type Enumerations	66
Table 7-16	Lead_index_mapping_standard Type	43	Table 7-54	Moisture_sensitivity_enum Type Enumerations	66
Table 7-17	Lead_mapping_table Group and Lead_mapping_item Element	44	Table 7-55	Stress_sensitivity_type Type	67
Table 7-18	Lead_group_list Group and Lead_group Element	44	Table 7-56	Stress_type Type	67
Table 7-19	Single_lead_type Type	45	Table 7-57	Chemical_compatibility_type Type	67
Table 7-20	Pattern Type	45	Table 7-58	Process_conditions_type Type	68
Table 7-21	Rectangular_pattern Type	45	Table 7-59	ESD_requirement_type Type	68
Table 7-22	Circular_pattern Type	47	Table 7-60	ESD_classification_type Type	68
Table 7-23	General_pattern Type	48	Table 7-61	HBM_enum Type Enumerations	69
Table 7-24	Body_composition_type Type	48	Table 7-62	CFM_enum Type Enumerations	69
Table 7-25	Body_components_type Type	48	Table 7-63	Packing_type Type	70
Table 7-26	BGA_composition Type	49	Table 7-64	Packing_standard_enum Type Enumerations	71
Table 7-27	Leadframe_composition Type	50	Table 7-65	Packing_type_enum Type Enumerations	72
Table 7-28	Other_substrate_composition Type	51	Table 7-66	Pin1_position_enum Type Enumerations	72
Table 7-29	Connector_composition Type	52	Table 7-67	Packing_vacumn_degree_enum Type Enumerations	72
Table 7-30	Optical_device_composition Type	53	Table 7-68	Baking_requirement_enum Type Enumerations	72
Table 7-31	Design_constraint_geometry_type Type	54	Table 7-69	Long_term_heat_resistance_enum Type Enumerations	72
Table 7-32	Package_keepout_area_and_height Type	55	Table 7-70	Packing_requirement_on_ESD Type	73
Table 7-33	Package_keepout_space_3D Type	55	Table 7-71	ESD_requirement_for_intermediate_packing Type	73
Table 7-34	Hole_keepout_area_list group and Hole_keepout_area Element	56	Table 7-72	ESD_requirement_for_direct_packing_material Type	74
Table 7-35	Hole_type_enum Enumerations	56	Table 7-73	Environment_info_type Type	74
Table 7-36	Design_constraint_geometry_list group and Design_constraint_geometry Element	56	Table 7-74	Storage_info_type Type	74
Table 7-37	Size_and_tolerance Type	57	Table 7-75	Storage_humidity_level_enum Type Enumerations	75
Table 7-38	Geometry_and_material Type	57	Table 7-76	Storage_temperature_level_enum Type Enumerations	75
Table 7-39	Material_type Type	58	Table 7-77	Package_vacumn_degree_enum Type Enumerations	75
Table 7-40	Stress_strain_property Type	58	Table 7-78	Supplier_info_type Type	75
Table 7-41	Interpolation_table_list group and Interpolation_table Element	59	Table 7-79	Structure of IPC-2552 File Header	76
Table 7-42	Point_list Group and Point Element	59			
Table 7-43	Geometry_labels_type Type	59			
Table 7-44	Label_item Type	60			
Table 7-45	Weight_type Type	60			

General Electronic Components Model Based Definition (MBD) Standard

1 SCOPE

This standard defines the set of specification elements for components and parts to be assembled and connected onto printed boards. These specification elements mainly cover the component specifications in strong correlation with board-level manufacturing (e.g., SMT, THT, Press-Fit), assembly and board-level reliability.

1.1 Purpose This standard provides a digital model-based standard defined to realize efficient and high-quality digital design of board-level assembly (e.g., mounting, assembly, reliability) and to support the final realization of virtual manufacturing of electronic assembly.

1.1.1 Application of This Standard This standard is applicable to components and parts to be mounted and assembled on printed boards. These components mainly include passive components (e.g., RC, soldered structural parts), discrete components (e.g., transistors), IC, on-board connectors, RF components, optical components, etc.

The potential uses of data from this standard will be applicable to, for example, printed board layout, DFX, SMT machine data libraries, operation documentation, incoming material inspection, material purchasing decision-making, printed board CAD to 3D-CAD conversion, etc.

The implementation of this standard is based on the 3D model of components, and on this basis, the key specification elements to be included in the 3D model of components are defined.

The key specification elements defined in this standard are derived from the requirements of board-level design and simulation activities, with the purpose of achieving better DFX (design for manufacturability, assembly and reliability) characteristics. This standard mainly focuses on the structure, material and process characteristic parameters of components related to board-level manufacturing process and long-term application.

1.2 Classification IPC standards recognize that electrical and electronic assemblies are subject to classifications by intended end-item use. Three general end-product classes have been established to reflect differences in manufacturability, complexity, functional performance requirements, and verification (inspection/test) frequency. It should be recognized that there may be overlaps of equipment between classes.

CLASS 1 General Electronic Products

Includes products suitable for applications where the major requirement is function of the completed assembly.

CLASS 2 Dedicated Service Electronic Products

Includes products where continued performance and extended life is Required, and for which uninterrupted service is desired but not critical. Typically, the end-use environment would not cause failures.

CLASS 3 High Performance/Harsh Environment Electronic Products

Includes products where continued high performance or performance-on-demand is critical, equipment downtime cannot be tolerated, end-use environment may be uncommonly harsh, and the equipment must function when Required, such as life support or other critical systems.

1.3 Definition of Requirements The words **shall** or **shall not** are used in the text of this document wherever there is a requirement for materials, preparation, process control or acceptance.

The word “should” reflects recommendations and is used to reflect general industry practices and procedures for guidance only.

Line drawings and illustrations are depicted herein to assist in the interpretation of the written requirements of this Standard. The text takes precedence over the figures.

1.4 Order of Precedence The contract **shall** take precedence over this standard, referenced standards and drawings.

In the event of conflict, the following order of precedence applies:

- 1) Procurement as agreed and documented between user and supplier.
- 2) Master drawing, design brief or tech pack reflecting the user’s detailed requirements.
- 3) When invoked by the customer or per contractual agreement, this standard.

When documents other than this standard are cited, the order of precedence **shall** be defined in the procurement documents.

The user can specify alternate acceptance criteria.